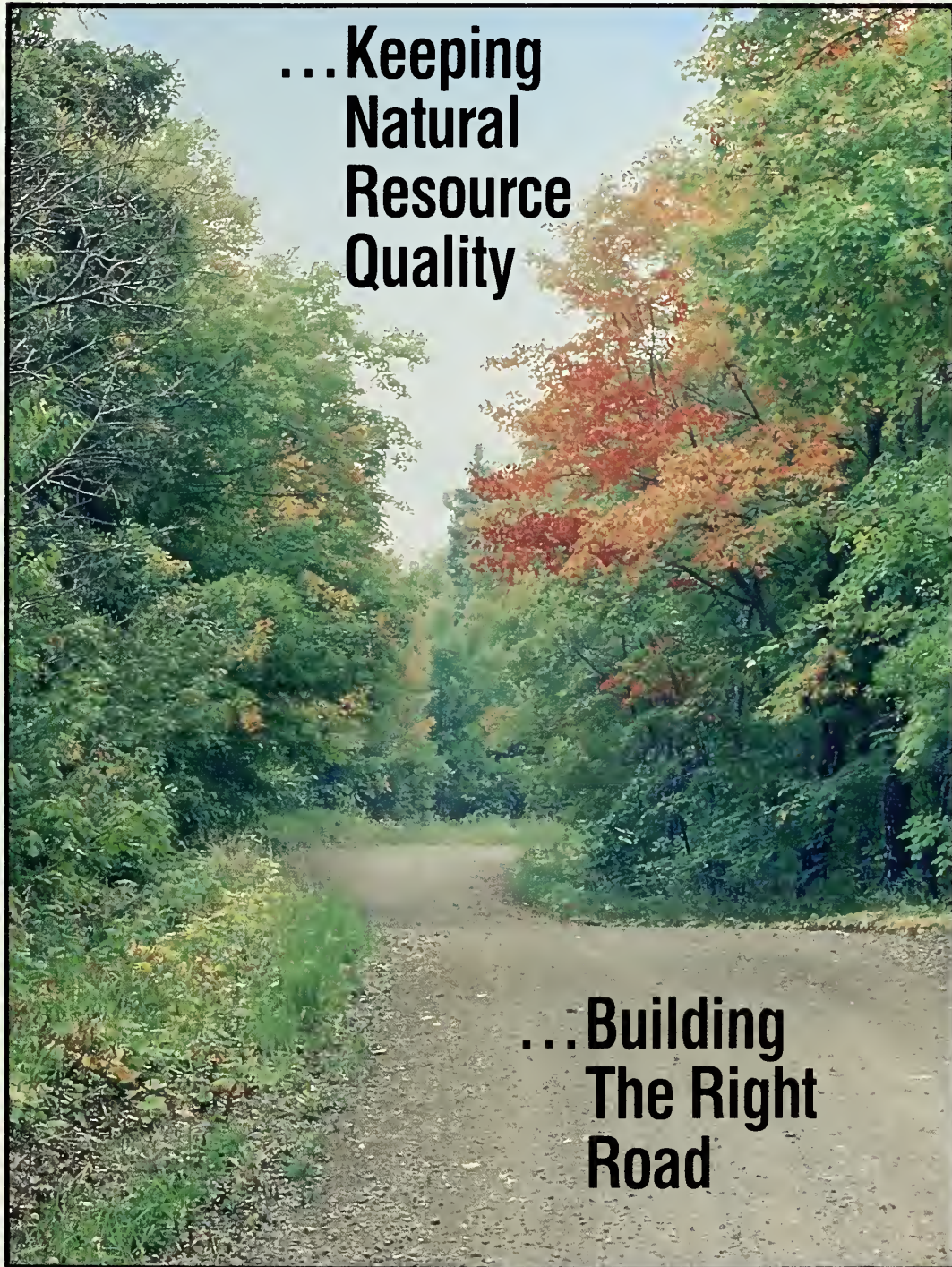


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NATIONAL FOREST ROADS FOR ALL USES



**... Keeping
Natural
Resource
Quality**

**... Building
The Right
Road**

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Roads in The National Forests

How The American Public and The Forest Service Are Working Together to Plan for The Future

All of us expect a lot from our National Forests. We expect them to provide recreation, range, timber, watershed, wildlife, fish and wilderness.

Getting people and resources in and out of a Forest requires a transportation network — roads and trails, big and small.

National Forest roads meet many needs. They also create several questions.

- Why are roads needed?
- How many roads are needed?
- Where are roads needed?
- What happens to environmental quality when roads are built?
- What are appropriate road standards?
- Why are roads open or closed?

Planning and developing this transportation network is not an easy task. Your comments on Forest land and resource management planning tell us that almost everyone agrees that the various forest resources need

to be managed in some manner. Most also agree that an environmentally acceptable transportation network is essential for National Forest management and use. The rub comes in defining just what is acceptable. Most concerns involve road standards, road density, soil erosion, road costs and traffic management.

All of us want the roads and the resources to complement each other. Forest Land and Resource Management Plans consider all the natural resources and provide integrated, compatible methods for that to happen.

This publication explains the history of roads in the National Forests, the current situation and direction for the future. The publication applies to National Forests in the 20 northeastern states, the Eastern Region of the USDA Forest Service.



Fire Protection



Habitat variety for wildlife



Sport vehicles and other recreation uses



Foot travel

**A well planned,
built and managed
transportation
network,
or a single road,
can support
many uses.**

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CATALOGING PREP



Timber harvest



Firewood cutting and gathering forest products



Watershed restoration projects and stocking fish



Administrative needs

100 Years of History Roads Were Created in Response to the Needs of a Growing and Changing Nation



The Beginning

The past 100 years have seen phenomenal economic, industrial and social growth and change. Around the turn of the century, logging operations stripped away the timber, wildfire often consumed the debris left behind, and rains washed away topsoil. Farmers then cleared remaining trees to have fields. Some cleared land couldn't support farms, some eroded . . . and the fragile land became vacant.

The land and remaining forests needed protection. In 1891 Congress created the Forest Reserves. They were renamed National Forests in 1905. The Forest Service

then was designated to protect and manage those forests.

Cutover and abandoned lands needed protection and rehabilitation. Congress passed the Weeks Law in 1911 to purchase these lands and make them part of the National Forests.

The National Forests of the Eastern Region were created from a patchwork of forested land and farms intermingled with cities and towns. The Forest Service inherited many miles of roads and trails — the good and the bad — already on this land, and those miles became part of the transportation system.

In addition, a network of roads was built to move forest products

to markets. This road network also offered access for fire protection, tree planting and erosion control, and recreation.

The Great Depression

With funds appropriated by Congress, additional forested lands were purchased and the National Forest system expanded.

The Forest Service contributed to economic recovery — it put people to work, providing jobs and housing for the Civilian Conservation Corps (CCC). In turn, CCC crews improved old roads and built many miles of new roads. Between 1933 and 1942, their work improved and expanded the Forest Service road

system in every eastern National Forest. This expanded road system set the stage for increased public use soon to come.

Post World War II

After World War II, people needed more forest products. Many new roads were built to get forest products to the marketplace. Those roads had to be good to accommodate the larger, faster trucks. Sometimes those roads were built on a better location a short distance from the old roads.

This created a maze of logging roads routinely used by the public. The public saw large timber cutting areas, logging residue and a multi-

tude of roads and skid trails. Concerns, questions and conflicts developed.

Many people believed all roads were open for use and would remain open forever. This led to conflict between various types of National Forest land use. The increased miles of roads, increased use and increased types of use caused continuing and escalating environmental and managerial problems.

Out of the 60's and 70's

Increasing demands for National Forest resources prompted Congress to pass the Multiple-Use, Sustained Yield Act of 1960. This

emphasized recreation, range, wildlife, water and timber.

Transportation systems, locations and standards of roads within the National Forests needed to be improved to meet increased demands.

Increasing environmental concern and awareness provided for new areas of emphasis and direction. In the 1970's, Congress set the framework for long-term land and resource management planning.

In the 1980's, as we implement our plans, we are resolving some long-standing Forest policy issues, one of which is the transportation system.

Today The Forest Road Network Responds to a Variety of Challenges and Concerns



Public and private lands often are intermingled in National Forest areas. As shown in the enlarged area (above) private, town, county, state and National Forest roads make up the road network.



Today's transportation system has many types of roads. Not all meet tomorrow's needs.

Many of the road problems faced today were on the land when it was purchased by the federal government. Other problems were created by the changing needs of the Forest Service and the public.

Public perceptions are that some forest roads are not good enough while others are better than needed. The public has expressed concern that some roads are in poor locations, such as too close to

stream banks or on highly erosive soils. Some people feel too many roads are being built.

Many roads are highly visible, disturbing the natural appearance of the forest landscape. Older, minimum standard roads, on the other hand, tend to blend with the landscape.

Over the past decades, System (permanent) roads were inventoried and managed to provide forest access. All other roads were considered Non-system (temporary), for they were neither located nor built for long-term use.

Non-system roads were not inventoried. Usually, only when natural forces caused a road to become impassable did the use stop and the land return to resource production.

Many of the roads needed for the next 10 years to handle the types of vehicles and traffic volume using them are already in place and require only minor upgrading to meet resource management needs. Fortunately, in most reconstruction the same opening created by an existing road often can be re-used. This helps reduce the visual disturbance.

Surfaced high standard road



Minimum standard road





ARTERIAL ROADS provide service to large land areas, usually from 3,000 to 10,000 acres. In many cases, arterial roads are public highways.



COLLECTOR ROADS are intermediate links. They connect major, heavily traveled, multiple-purpose arterial routes and single-resource local roads. A collector road usually services several local, dead-end roads.



LOCAL ROADS connect terminal facilities, such as log landings and recreation sites, with forest collector or arterial roads, or with public highways. They often are less than 1.5 miles long and serve a single resource.

The major arteries of the transportation system generally are in place.

A two-part road network exists on some Forests — System (permanent) and Non-system (temporary) roads. System roads include arterial and collector roads serving large land areas and local roads which allow access to specific resource activities.

Many of the arterial and collector roads are those the Forest Service inherited.

Very few new arterial and collector roads need to be built. Most of the Forest Service planning for future transportation systems focuses on local road construction and reconstruction.

Non-system roads are built for a specific activity lasting only a short time, and then the roads are to be returned to resource production. In the past, some Non-system roads were not properly closed. That created confusion among the using public, for low standard System roads and Non-system roads often looked alike.

Shorter roads, generally of minimum standard, are needed in today's Forests. Some places, such as Wilderness, will have no roads.

A review of proposed Forest Plans and their significance in setting direction for the next 10 years sharply focuses public attention on the overall road network and its

impact on National Forest use. Important aspects include the need for roads, standards of new construction and the reasons for future traffic management practices.

Because most arterial and collector road needs are met, most new roads can be shorter, dead-end, and of lower standards.

Some people feel local roads should provide year-round access for a continuous flow of products or recreation opportunities. (This type of access requires relatively high road standards.) Others feel local road standards must be lowered, to provide primitive or semi-primitive recreation opportunities and to protect wildlife habitat. There are places where no roads will be constructed, such as Wilderness Areas and other special

management areas.

Some local roads are over-constructed — built to standards higher than needed. This, understandably, adds to public concern.

What can be done? Local roads should not be constructed to higher standards than necessary. This will reduce costs and insure that road standards match road needs. In turn, this will make it easier for the Forest Service to close local roads when the planned uses for the roads are completed.

Transportation systems on National Forests in the Eastern Region can be improved. They can be brought more closely in line with public concerns without lowering forest quality. The direction is available through the Forest Land and Resource Management Plan.

Local roads are built to lower standards, require smaller investments and affect the resource less.



The Forest Land and Resource Management Plan

Developed by The Forest Service in Cooperation with The Public



The Forest Service has spent a lot of planning time on the entire road situation. We have listened to the concerns of the public.

We have developed a Forest Plan for each of the Forests in the Eastern Region. The plans provide for protection of resources and their val-

ues, and they favor general public use. These Forest Plans will be put into action in an integrated manner by working with the public.

Integration considers all resources and public input within a specific geographic area at the same time. Forest Service specialists (soil scien-

tists, geologists, foresters, engineers, landscape architects, hydrologists and wildlife managers) contribute their individual expertise as an interdisciplinary team.

Using public input and resource information, they determine how and why each road should be used;

decide on the necessary standards and best location; determine the effects on soils, timber, wildlife, water and recreation; develop traffic management methods . . . going through a number of considerations until the best plan is developed.

Transportation analysis is an es-

sential part of integrated management. It is a process used to determine the best means of accessing the Management Areas, called for in the Forest Land and Resource Management Plan. Many different criteria are considered in determining what access is needed.



Criteria Considered in Building Useful Roads to the Right Standard

Design criteria are necessary in determining road standards. They describe the necessary operating conditions of each road. These criteria can be used over a wide range of conditions as planners and the public work toward a decision which will fit the needs of all resources.

- **Resource Management Objectives**
Objectives define the types of activities the road will serve, give a general idea of the needed location, identify any possible harm to resources, and provide operating and maintenance guidelines. They may also indicate the need for roads or no roads, such as in a Wilderness.
- **Environmental Constraints**
Constraints identify sensitive soil areas and important wildlife or fisheries habitat. They may limit the location possibilities for a road or require special treatment of road-sides. Visual quality concerns — the scenery — also are considered here.
- **Safety**
Safety factors contribute to the selection of road design elements and vehicle speed. Possible safety hazards must be examined and corrected or avoided. This element identifies traffic control and road maintenance needed for safety.
- **Physical Environmental Factors**
Such factors as topography, climate and soils affect the road location, alignment, gradients, sight distance, slope selection, drainage, surfacing, etc.
- **Traffic Requirements**
The expected volume, composition and distribution of traffic are used in the design of turnouts, road widths and surfacing.
- **Traffic Service Levels (TSLs)**
This element considers significant traffic characteristics and operating



conditions for a road. It also considers service to road users through traffic flow, amounts and types of traffic expected, safety and road surface. This information determines and describes the service to users through four Traffic Service Levels. (next page)

- **Vehicle Characteristics**
Physical characteristics of vehicles using the road are described, such as bicycles, automobiles, logging trucks or recreational vehicles.
- **Road User**
This consideration includes selection of road standards based on a road user being a safe and reasonable driver.
- **Economics**
Roads must serve the projected total traffic requirements at the lowest cost consistent with environmental protection, and with user safety considerations always in mind.

... resulting in increased public benefit

Design criteria deals with all roads — arterial, collector and local. Roads built to the minimum standards necessary for the intended use or uses will do the job required of them, do them economically and provide maximum public benefits. Considering the roads themselves, the lower the acceptable road standard, the less the cost of survey, design and construction. Future average road construction cost per mile should decrease. Because there are many different standards for roads, roads planned for different uses may look different. Traffic management may differ from road to road. In the end, road designs will meet Forest Land and Resource Management Plan objectives.

Four Levels of Service are Provided for The User



Traffic Service Level A

These are normally high standard roads, most often arterial. They are often two-lane, blacktopped roads. (Local and collector roads seldom are Traffic Service Level A.)



Traffic Service Level B

Usually a collector road and usually gravel surfaced. May be considered a medium standard road. May be single or double lane, with mixed timber and recreation traffic. Traffic controls may be applied to reduce traffic volume and conflicts. Road location is strongly influenced by topography. Road surface is stable for most traffic during the normal use season.



Traffic Service Level C

Normally considered a local road, of minimum standard. Traffic flow is interrupted by limited passing facilities or slowed by road condition. Most safety features are provided by traffic management, such as single lane or allowable hours or season of use. Usually managed open, but can be closed depending upon resource needs. Road location is dictated by topographic features and environmental factors. Road surface may not be stable under all traffic or weather conditions and may have rutting and dust.



Traffic Service Level D

Usually a low-standard, local road or travelway, with slow traffic flow which may be blocked by an active resource activity (such as logging or mining). Two-way traffic is difficult and may require backing of one vehicle for another to pass. Some vehicles cannot travel on these roads. Road surface may be rough and irregular. Use may be discouraged or road closed immediately after the resource activity ends. When closed, the road usually is seeded with grass for erosion control and wildlife purposes, or allowed to revegetate naturally. The road would normally not be needed until re-entry, years later for a resource activity, such as a timber harvest. Temporary bridges and culverts are permissible.

In many cases, Traffic Service Level C roads may be managed for administrative use only and Traffic Service Level D roads closed and/or revegetated. When resource objectives require closing the road to vehicles, we will usually post signs explaining why they are closed and welcoming non-motorized public use.

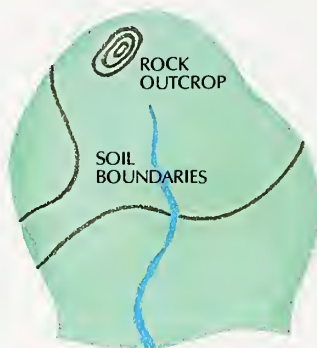
The Forest Land and Resource Management Plan

An Illustration of How Resources are Inventoried, and Public Opinion is Used to Meet Multiple Use Objectives.



Base Map

The base map shows a geographic land area to be analyzed. It has two different Management Areas (3.1 & 6.1) with different objectives to be achieved over time. All resource information, management objectives and road criteria are analyzed together to determine road location, standards and traffic management.



Soils/Water

The soils information will include a map showing the critical soils — those that will and will not support vehicle traffic with and without road-bed support — and physical barriers such as cliffs, swamps, large rock formations, etc. The water information will include water-courses, erosion concerns, water quality concerns, etc.



Wildlife

The wildlife information includes threatened or endangered species, existing wildlife habitat improvements, opportunities for habitat improvements, species to be emphasized, age and distribution of vegetation desired. The example shows bear as the emphasized species in the upper part and deer in the lower part. It also shows two permanent wildlife openings.



Recreation

The recreation information includes existing opportunities and a variety of future opportunities. These are the opportunity types: Primitive (P); semi-primitive, non-motorized (SPNM); semi-primitive, motorized (SPM); roaded-natural (RN); rural (R), and urban (U). Most are self-explanatory; "roaded-natural" means a natural environment with a road of a quality suitable for motorized vehicles. The upper part of the example is semi-primitive, non-motorized (SPNM); the lower part is roaded-natural (RN).

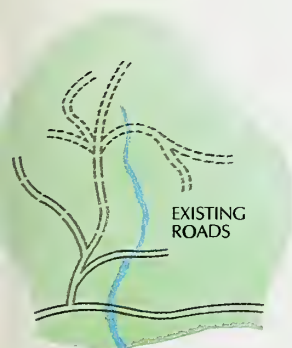
This is a hypothetical example of blending inventoried resources with public opinion.

The geographic land area to be analyzed is usually larger than 5,000 acres. The exact area is determined by considering public concerns and proposals, the desired future condition, and its resource and

environmental needs. Each geographical area is evaluated by an interdisciplinary team.

Every area includes several inventory sub-units (specific resources). The data about the resources helps us make better decisions on transportation system needs and other needs for the entire area.

If areas of fewer than 5,000 acres were used, they may not be large enough to include the transportation needs of adjacent lands. Road construction may be in the wrong location to efficiently serve the long-term needs of the geographical area. Relocation could become necessary later, creating a greater impact on



Roads

The road information shows all existing roads, rights-of-way and road ownerships. Some of these travelways may be unnecessary for Forest management and could cause soil and water damage. This example shows a high road density.



Visual Quality

The visual quality objective is based on the acceptable degree of changes in the landscape. There are five visual quality objective classes: Preservation (P), retention (R), partial retention (PR), modification (M) and maximum modification (MM). Our example shows Modification (M) and retention (R).



Timber

The timber information includes acres by timber condition, age distribution, reforestation needs, harvest opportunities and suitability for timber production, etc. Our example shows areas where vegetation treatment can be used to reach multiple-use objectives.



The right roads... retaining natural resource quality

the land.

With specific resource information in hand, planners then turn to the road design criteria to determine the standards to which a road will be constructed and managed.

This example of a geographic land area shows a summarized, simplified analysis to determine road locations,

management, density and construction standards which will meet the desired condition.

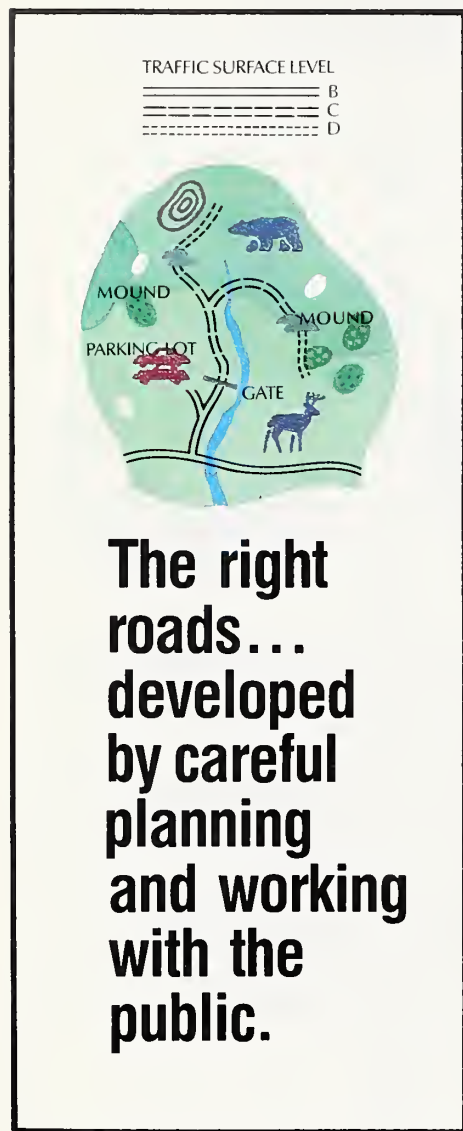
In this example, the base map (above, far left) is used as a point of reference. It shows management areas, land ownership, water bodies, and existing arterial, collector and local roads.

To complete the example, we will need to inventory these existing resources:

- Soils/Water
- Wildlife
- Recreation
- Roads
- Visual Quality
- Timber

The Forest Land and Resource Management Plan

An Integrated Approach to Management... a Partnership of Standards and Use



After the resource data (including public concerns) are gathered, interdisciplinary consideration begins. All resource uses are considered and translated to the road design to determine the level of service the road must provide.

Preliminary conclusions and plans are then taken to the public for response to specific issues and concerns.

From the basic work and public response, final adjustments are made and a transportation system evolves which will reach the goals of multiple-use management. For instance, in the example, the first one-half mile of road allows mixed traffic up to the fork. This road is Traffic Service Level (TSL) B. The parking lot provides walk-in access.

The area surrounding the next section of road will be managed for black bear habitat and provide an opportunity for semi-primitive, non-motorized recreation. Traffic should be restricted, although administrative (Forest Service) traffic would be permitted for habitat maintenance. The section of road from the fork to each wildlife opening is Traffic Service Level C.

In sections of road not needed for recurrent resource activities, constant vehicle use is unnecessary. The roads are closed and seeded to grass when the resource activity is completed. Walk-in recreation is welcome. Re-entry for timber harvest probably won't be needed for five to ten years. For these reasons, a Traffic Service Level D road is appropriate.

Road density is decreased to meet resource objectives. We also relocate some roads to avoid lowering soil and water quality.

Under past road construction practices, the entire road system might have been built to a higher standard, such as Traffic Service Level B or C.

Using the integrated approach to management, the transportation system would be built with a mix of TSL B, C and D roads. This results in considerable cost savings, better management of the natural resource and better environmental quality.

Decisions depend on knowing where existing roads are located.

Forest Plans provide specific directions for developing and managing the transportation system. The plans also describe, by management areas, the intended uses of the roads:

- All roads will be inventoried and decisions made about their intended uses.
- Roads not needed will be closed and the land managed for natural resource purposes.
- Roads needed but in undesirable locations will be relocated. Construction standards for permanent roads will be the minimum needed to meet intended uses. The former roads will be closed and seeded or, in low use areas, simply abandoned and left to return to a natural condition on their own. In some cases roads will be put back to original contour.
- Traffic management methods, such as road closures, restrictions and information signs, will be applied to roads based on their intended use and the safety of users.

Putting Forest Land and Resource Management Plans to work.

We — the Forest Service — are excited about the use of interdisciplinary teams to put the Forest Plans to work. This teamwork and the ultimate plan gives us the flexibility to respond to the issues which concern you most. This flexibility also allows fitting the road standard to the use on a cost effective basis.

Limited Access is a Positive Method of Resource Management



Roads can be used for hunting and other walking recreation even though they are closed to vehicles.



Minimum standard local roads not needed until later may be closed with an earthen berm.



Berry picking, hiking, backpacking, reaching a fishing area, nature photography . . . most people feel the solitude created by limited access increases the quality of recreation.



Road closures will be decided on a road by road basis, dependent on intended use, standards and resource needs.

More attention is being given to closing roads as a means of protecting resources. This is an option when weather (such as during spring thaw) or road standards cannot provide for safe use. Not all roads will be closed. Closure is determined on a road by road basis, dependent on intended use, road conditions, standards and resource needs.

Public attitudes toward this

method of traffic management vary. Some people believe National Forest roads built with public money should be open to public vehicular use as a right. Others believe that, since primitive and semi-primitive recreation opportunities and wildlife habitat are not readily available on private lands, National Forest lands are the most logical places to provide them.

While most roads will remain

open year-round, the Forest Service must close some System roads to protect wildlife and other resources. Closure periods range from a few months each year to several years. This is an effective and flexible management tool.

We plan to return Non-system roads to resource production once the activity for which they were constructed is finished.

Monitoring of Standards, Traffic Management and Public Concern...

Roads play an important part in determining whether the National Forests of the Eastern Region can meet the diverse and growing needs of the public. Multiple-use management needs roads.

Care is needed in road planning and construction. Roads must not be built everywhere. Standards can provide a variety of roads to meet intended uses. Roads must be built to the appropriate standards and will look different because of differing resource and environmental needs from one area to another.

The Forest Plan requires monitoring of National Forest management actions and public concerns. Public input will help achieve better communications and high quality results. It will also assure that road location, design and management respond to Forest Plan directions within the multiple-use concept.

National Forest managers and planners continually work to improve decisions for the management of all natural resources. The example in this publication shows a method of making better overall

management decisions while it explains the basis for road building standards applied to the area.

We have emphasized the importance of interdisciplinary thinking and action. Forest Service managers will remain sensitive to the needs and concerns of those interested in and affected by National Forest management policies and practices. Their role as public land managers is to balance all these considerations and choose what is best for everyone. Only through continued two-way communication with you can we fulfill this role effectively.

We take pride in our efforts to provide service and manage the public resources. We look forward to working with you as individuals and as groups to reach the objectives in the Forest Land & Resource Management Plan over the next 10 years. With this kind of communication and cooperation we will assure that present and future generations are served well by the National Forests.

By Working Together Now, Present and Future Generations Will Be Well Served By The National Forests



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